Chapter III: Puerto Rico's Broadband Landscape

A. Introduction

This chapter analyzes the latest data available on the Puerto Rico broadband landscape. This assessment covers the scope, size, and nature of the digital divide across Puerto Rico, focusing on both the demand- and supply-side broadband landscape and gaps across Puerto Rico. This assessment defines the challenge that Puerto Rico is faced with as it pursues policies to ensure digital inclusion for all citizens regardless of where they live, their social or economic status, or any other factors that may be preventing them from benefiting from broadband and the Internet.

The chapter is divided into two sections examining, first, the Puerto Rico broadband network or infrastructure landscape and, second, the broadband adoption or usage across both households and businesses in Puerto Rico. Various data sources are used for this assessment including broadband inventory data collected under the federal State Broadband Initiative (SBI) grant program, managed by the National Telecommunications and Information Administration at the Department of Commerce. The SBI was established to assess the broadband gaps across the U.S. and its territories.[1] Residential and business broadband adoption data is also based on data collected under the SBI grant program through two random digit dial surveys of residential homes and businesses on the island. The purpose of this demand-side research is to better understand the drivers and barriers to technology and broadband adoption and estimate the broadband adoption gap across the territory of Puerto Rico.

B. Puerto Rico's Broadband Infrastructure

This section analyzes the broadband inventory across Puerto Rico, in order to identify broadband infrastructure gaps at various speeds of connection across the island. It also provides a preliminary assessment of the significance of this digital gap in light of the recent reform by the Federal Communications Commission of the Universal Service Fund.[2] The broadband inventory is based on data collected by Connect Puerto Rico, a non-profit working on behalf of the Office of the Chief Information Officer of the Government of Puerto Rico (OCIO), as part of the State Broadband Initiative (SBI) federal grant program. One of the key goals of the SBI program is the creation of a National Broadband Map to provide granular inventory of the broadband capacity available across the U.S. and its territories, by service speed tier and type of platform. This detailed database can be found at http://broadbandmap.gov/. This federal effort is undertaken in partnership with U.S. states and territories that collect and submit data to the Department of Commerce on a bi-annual basis. The National Broadband Map was first released in February of 2011, is updated twice yearly, and is funded through the American Recovery and Reinvestment Act.[3]

The data collected by Connect Puerto Rico represents the most granular, comprehensive mapping effort to date of the broadband infrastructure across Puerto Rico.

The Puerto Rico broadband inventory data follows the speed tier, granular, and geographic specifications set forth by the NTIA under the SBI program. Connect Puerto Rico is charged with collecting, validating, and aggregating data from multiple broadband providers across the island regarding their service territory by speed and platform. The purpose of this work is to measure the level of broadband service available to Puerto Rico and identify communities and households that remain unserved or underserved by broadband service; information that is essential to estimate the broadband availability gap in the state and understand the scope and scale of providing ubiquitous broadband service to all Puerto Ricans.

The data collected by Connect Puerto Rico represents the most granular, comprehensive mapping effort to date of the broadband infrastructure across the island. The data includes the majority of known broadband providers on the island; however, there are some broadband providers that were unable or unwilling to participate in the program to date.[4]

Connect Puerto Rico welcomes collaboration with all broadband providers in Puerto Rico to achieve a comprehensive, accurate database of the actual inventory across the island. Based on this data collection effort, Connect Puerto Rico has produced the first interactive online map of the broadband inventory across the island, available at http://www.connectpr.org/interactive-map.

The interactive online platform aims to provide granular, transparent information regarding broadband available across each community in Puerto Rico. This information is useful to both consumers seeking competitive broadband offerings, and the provider community. The Connect Puerto Rico maps are an ongoing project and will be updated twice-yearly through the duration of the SBI program. In every iteration of the map, Connect Puerto Rico aims to incorporate new broadband infrastructure build-out, include previously unavailable data, and include corrections to existing data as needed. There is a degree of measurement error inherent in this mapping exercise, which needs to be taken into consideration when analyzing the data. This measurement error will decrease as the maps become active tools for local, national, and federal stakeholders, who will be able to identify areas where the displayed coverage is under- or over-estimated. Connect Puerto Rico welcomes such feedback, to be analyzed in collaboration with broadband providers to correct errors identified in the maps.[5]

The data evaluated in this section represents the known broadband inventory available across the island as of June 30, 2011. This data was submitted by OCIO and Connect Puerto Rico to the Department of Commerce on October 1, 2011. The section first evaluates the broadband landscape available across Puerto Rico by speed tier, technology platform, and demographic density across served and unserved areas; and, second, it evaluates the broadband landscape across Puerto Rico's 78 municipalities by speed tier and technology platform.

1. Broadband Availability by Speed Tier

Table III.1 shows estimates of the numbers and percentages of households across Puerto Rico having broadband available at various download speed tiers.[6] Data included in Table III.1 does not include mobile broadband service.

Table III.1 - Broadband Availability by Fixed Networks Across Puerto Rico - By Speed Tier

	Unserved Households	Served Households	Percent Households Served
Download/Upload Speed Tiers	**('000)**	**('000)**	
At Least 768 Kbps/200 Kbps	177	1,084	86%
At Least 1.5 Mbps/200 Kbps	187	1,074	85%
At Least 3 Mbps/768 Kbps	544	717	57%
At Least 6 Mbps/768 Kbps	742	519	41%
At Least 6 Mbps/1.5 Mbps	834	427	34%
At Least 10 Mbps/768 Kbps	860	401	32%
At Least 25 Mbps/768 Kbps	1,261	0	0.00%
At Least 50 Mbps/758 Kbps	1,261	0	0.00%
At Least 100 Mbps/768 Kbps	1,261	0	0.00%
At Least 1 Gbps/768 Kbps	1,261	0	0.00%

Source:Connect Puerto Rico, June 2011

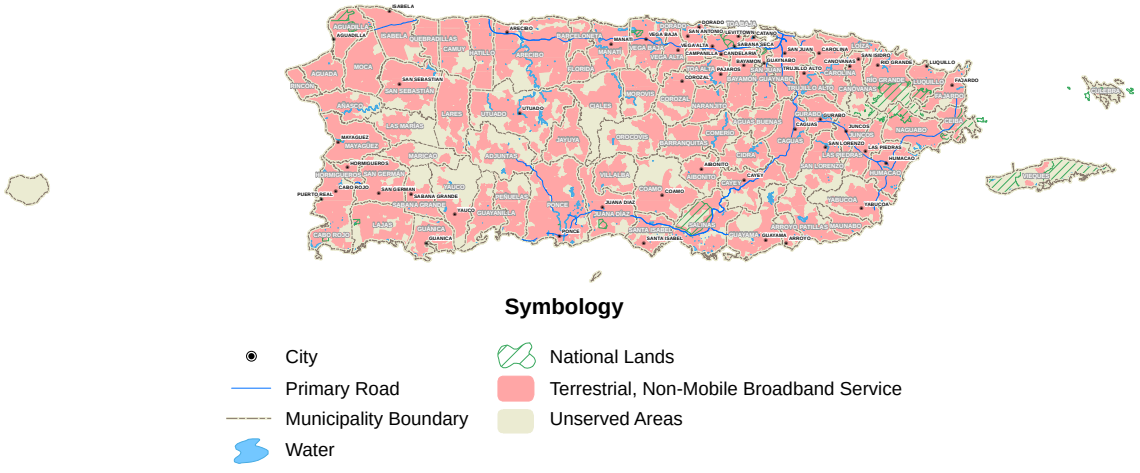
The total number of households in Puerto Rico according to the 2000 U.S. Census was approximately 1.26 million.[7] By June 2011, broadband of speeds of at least 768 Kbps download and at least 200 Kbps upload was available to approximately 86% of all Puerto Rico households.[8] This means that approximately 177,000 Puerto Rico households, or 14%, remain unserved by any form of fixed broadband. This broadband availability gap affecting an estimated 14% of Puerto Rico households is in stark contrast with the national average estimates for unserved areas across the U.S. of 5%.[9] Puerto Rico, therefore, is significantly lagging behind in basic broadband infrastructure build-out.

An estimated 14% of Puerto Rico households, or approximately 177,000, have no fixed broadband available.

The speed capacity of at least 768 Kbps download and at least 200 Kbps upload is the most basic speed that is classified as broadband by the FCC as of the report's release. This basic broadband speed service is selected by the FCC as the key benchmark to determine what areas across the U.S. will be eligible for funding through Phase I of the newly created Connect America Fund, aimed to subsidize broadband build-out where there is none (for more information on this reform, see Chapter IV below).[10] Based on the new rules of the Connect America Fund for Phase I, areas across Puerto Rico that do not have this basic broadband infrastructure today depicted in Figure III.1 below will be eligible to receive funding beginning in 2012.

Figure III.1 depicts available fixed broadband across Puerto Rico at this basic speed of at least 768 Kbps download/200 Kbps upload. Areas in pink represent areas where fixed broadband is available via cable, DSL, or fixed wireless platforms (this broadband inventory does not include mobile broadband coverage). Areas in beige represent unserved areas that will be eligible for funding under Phase I of the Connect America Program.

Figure III.1 - Broadband Inventory of Advertised Service of At Least 768 Kbps Download/200 Kbps Upload Speeds, June 2011[11]

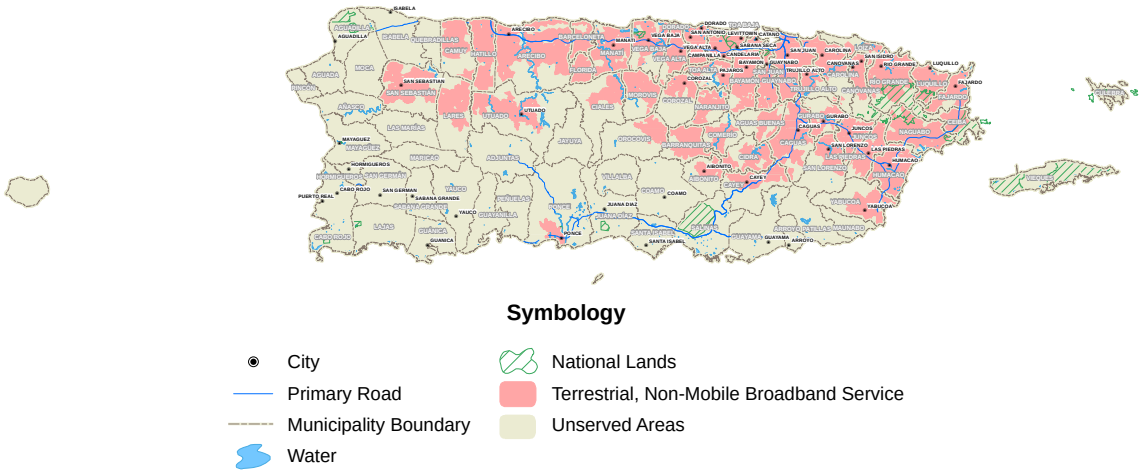


An estimated 57% of households across Puerto Rico have fixed broadband available to at least 3 Mbps download and 768 Kbps upload speeds. This implies that most broadband infrastructure built across Puerto Rico to more than 544,000 households has not been connected to technology that allows for speeds of at least 3 Mbps download / 768 Kbps upload (Figure III.2). This is a significant lag in deployment of capacity at this higher speed tier that demonstrates a second capacity gap across the island. While there is a basic infrastructure gap across parts of the island where approximately 14% of households are located, there is a second, wider gap affecting areas where approximately 43% of all households are located that may have basic broadband, but do not have service at the threshold of 3 Mbps/768 Kbps.

The 4 Mbps download and 1 Mbps upload actual speed capacity is selected by the FCC as the key benchmark under the newly created Connect America Fund to determine what areas across the U.S. and territories will be eligible for funding through Phase II, expected to be implemented in 2013.[12] Figure III.2 approximates the areas across Puerto Rico that would be eligible for Phase II funding of the Connect America Fund as of June 2011.

Note that the infrastructure depicted in Figure III.2 and reported in Table III.1 above, corresponds to broadband inventory that meets both the stated download and the upload benchmark, and not just the download speeds of 3 Mbps. Many providers across Puerto Rico do offer residential commercial service of at least 3 Mbps download speeds (in some cases as high as 12 Mbps download speeds); however, these commercial offerings are not reflected in the data reported here if they offer upload service capacity below the 768 Kbps benchmark. Similarly and unless the FCC changes its stated plans for the Connect America Fund, infrastructure that does not meet both the download and upload targeted thresholds will not be taken into account by the FCC as it defines eligible areas for broadband subsidies under the new Connect America Fund.

Figure III.2 - Broadband Inventory of Advertised Service of At Least 3 Mbps Download/768 Kbps Upload Speeds, June 2011[13]

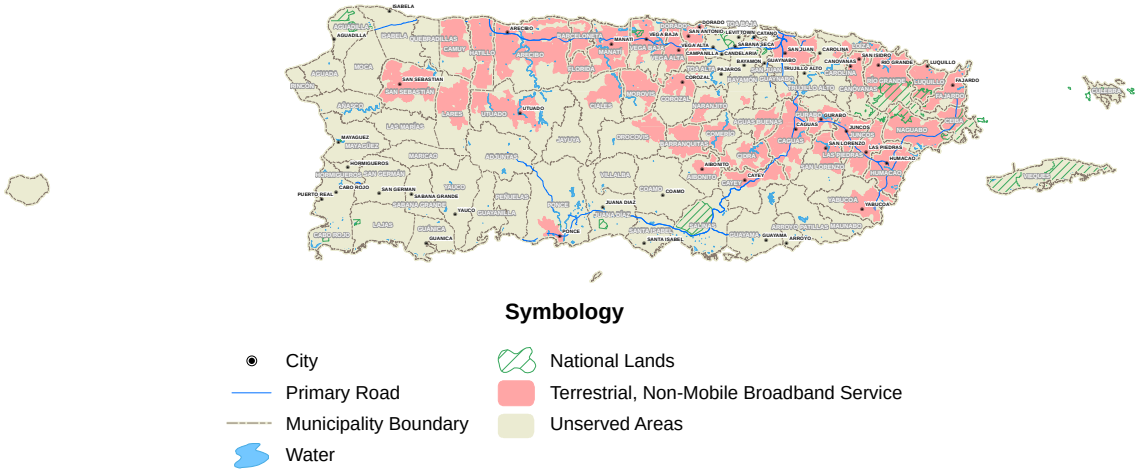


Access to fixed broadband service at speeds of at least 6 Mbps download and 768 Kbps upload is available to approximately 41% of all households. Access to fixed broadband at speeds of at least 6 Mbps download and 1.5 Mbps upload is available to an estimated 34% of all Puerto Rico households as represented in Figure III.3. This suggests that across Puerto Rico the upload speed capacity gap is even more acute than the capacity gap when focusing only on download speed capacity. That translates into 834,000 households that do not have access to broadband at that capacity.

Only 57% of households have broadband available at speeds of 3 Mbps DL/768 Kbps UL, and only 32% at speeds of 10 Mbps/DL/768 Kbps UL.

Finally, broadband availability at speeds of at least 10 Mbps download and 768 Kbps upload is available to an estimated 32% of households in Puerto Rico. Based on the broadband inventory collected by Connect Puerto Rico, there are no commercial residential offerings across Puerto Rico at higher speed tiers. This contrasts sharply with the roll-out of high-capacity broadband infrastructure across the U.S. as measured in the National Broadband Map. As high-capacity investments continue to be rolled out across urban and suburban areas in the U.S. the digital lag across Puerto Rico is growing.

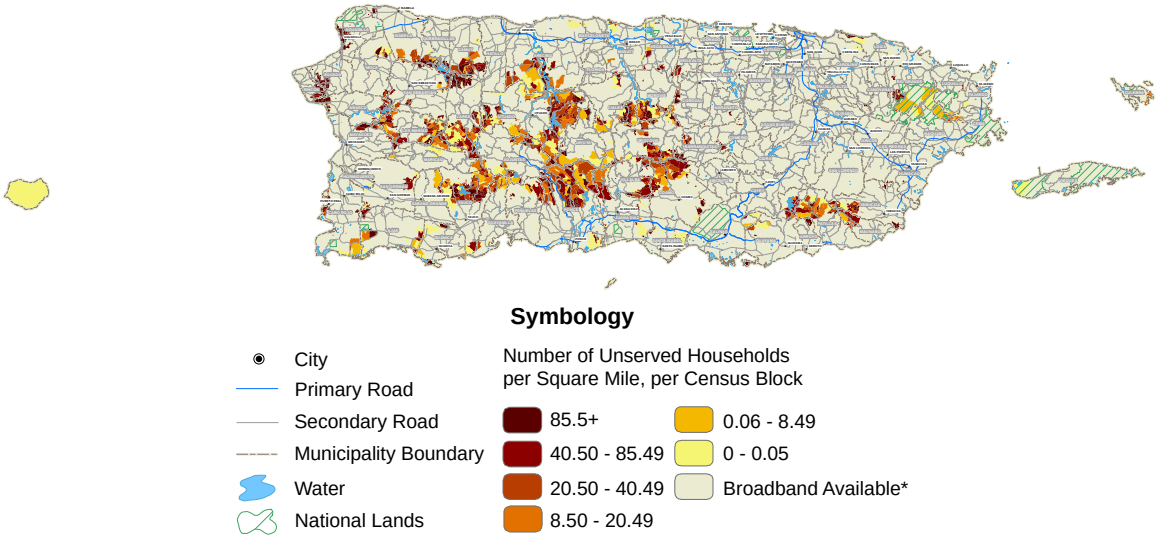
Figure III.3 - Broadband Inventory of Advertised Service of At Least 6 Mbps Download/1.5 Mbps Upload Speeds, June 2011[14]



When zooming in on the broadband infrastructure available in each Puerto Rico community, availability estimates reveal wide variances in measured broadband inventory, highlighting the importance of granular data in order to identify gaps in infrastructure across each community. Detailed inventory estimates at each of Puerto Rico's 78 municipalities are reported below. Availability by municipality as well as more granular, street-level broadband inventory data is available through Connect Puerto Rico's interactive, online broadband inventory map at http://www.connectpr.org/interactive-map.

Data also available through Connect Puerto Rico's interactive map are the density of households that are unserved by broadband providers. These data are available at the Census Block level throughout the island. Figure III.4 below shows the density of households that are unserved by a broadband provider of at least 768 Kbps download and at least 200 Kbps upload speeds.

Figure III.4 - Unserved Areas Without Broadband Infrastructure of At Least 768 Kbps Download/200 Kbps Upload - Indicating Density of Population by Census Block, June 2011[15]



The existing broadband inventory indicates that across Puerto Rico there is a lack of robust broadband offerings at basic and advanced speed capacity. There are two key broadband availability challenges in Puerto Rico: i) bridging the gap for approximately 14% of households that have no broadband available at any broadband speed tier; and, ii) promoting further capacity investment across the existing broadband network to ensure that the supply meets the broadband capacity needs of Puerto Ricans. The data showcase that no community is alike and granular data is essential to identifying and addressing the gaps in networks across each community.

It is important to note that the inventory of broadband measured in these maps and used to conduct this analysis is preliminary in nature. Data collected include the majority of known broadband providers in Puerto Rico; however, there are a few broadband providers that were unable or unwilling to participate. Furthermore, the measured broadband inventory provides an estimate of the true extent of broadband coverage. There is a degree of error inherent in this exercise, which needs to be taken into consideration when analyzing the data. To reduce measurement error, independent statistical and field validation techniques are used to improve the broadband data. The Connect Puerto Rico program encourages feedback on broadband service, which can be analyzed in collaboration with broadband providers to correct errors identified on the maps.[16]